

WHAT IS CLAIMED IS:

1. A driving assistance apparatus for displaying and
guiding a peripheral condition of a vehicle in an easily
5 understanding manner, comprising:

a camera mounted on a peripheral portion of the vehicle;
an virtual observing point converting unit which converts
an image picked up by the camera into an image viewed from
a virtual observing point;

10 a image synthesizing unit which synthesizes the images
viewed from a virtual observing point to display a peripheral
condition of the vehicle;

an obstacle sensing unit which senses presence of an
obstacle and which measures at least one of a distance from
15 the own vehicle up to an obstacle and a direction of the obstacle;
and

a safety area predicting unit which predicts a safety
area of the peripheral portion of the own vehicle, in which
the obstacle is not present, based upon the information acquired
20 by the obstacle sensing unit.

2. The driving assistance apparatus as claimed in claim
1, further comprising:

25 a safety area superposing unit which superposes the safety
area on the image synthesized by the image synthesizing unit

for display the superposed area.

3. A driving assistance apparatus for displaying and
guiding a peripheral condition of a vehicle in an easily
5 understanding manner, comprising:

a camera mounted on a peripheral portion of the vehicle;

an virtual observing point converting unit which converts
an image picked up by the camera into an image viewed from
a virtual observing point;

10 a image synthesizing unit which synthesizes the images
viewed from a virtual observing point to display a peripheral
condition of the vehicle;

an obstacle sensing unit for measuring a distance from
the own vehicle up to an obstacle and a direction of the obstacle,
15 and also for sensing presence of the obstacle by way of a
sensor;

an obstacle sensing unit which senses presence of an
obstacle and which measures at least one of a distance from
the own vehicle up to an obstacle and a direction of the obstacle;

20 and

an obstacle area superposing unit which superposes the
obstacle area on the image synthesized by the image synthesizing
unit for display the superposed area.

25 4. The driving assistance apparatus as claimed in claim

1,

wherein the obstacle sensing unit corresponds includes
a distance measuring sensor capable of measuring a distance
from the own sensor up to the obstacle, and outputs the shortest
5 distance from the own vehicle among the detected obstacles
as the distance up to the obstacle,

wherein the safety area predicting unit predicts a safety
area corresponding to an area is detectable by the distance
measuring sensor and the area is located within one of a sphere
10 and a circle where the distance up to the obstacle is defined
as a radius, while a mounting position of the distance measuring
sensor is used as a center of the sphere or the circle.

5. The driving assistance apparatus as claimed in claim

15 3,

wherein the obstacle sensing unit includes an
ultrasonic-wave sensor capable of measuring a distance from
the own sensor up to the obstacle, and outputs the shortest
distance from the own vehicle among the detected obstacles
20 as the distance up to the obstacle; and

wherein the obstacle area predicting unit predicts an
area where an obstacle is present, that corresponds to an
area detectable by the ultrasonic-wave sensor, and the area
located outside one of a sphere and a circle where the distance
25 up to the obstacle is defined as a radius, while a mounting

position of the ultrasonic-wave sensor is used as a center of the sphere or circle.

6. The driving assistance apparatus as claimed in claim
5 3,

wherein the obstacle sensing unit includes one of an ultrasonic-wave sensor having a plurality of ultrasonic-wave oscillating sources and an ultrasonic-wave sensor capable of varying a direction of the scanning operation,

10 wherein the obstacle area predicting unit grasps a substantially shape of the obstacle which is faced to a side of the own vehicle based upon the information derived from the obstacle sensing unit, and predicts the area where the obstacle is present, which involving a dimension of the obstacle.

15 7. The driving assistance apparatus as claimed in claim
2,

wherein the safety area superposing unit superposes the safety area predicted by the safety area predicting unit on
20 the image synthesized by the image synthesizing unit in at least one of a flickering display manner, a half-tone dot meshing display manner, and a transparent color display manner.

8. The driving assistance apparatus as claimed in claim
25 3,

wherein the obstacle area superposing unit superposes the obstacle area predicted by the obstacle area predicting unit on the image synthesized by the image synthesizing unit in at least one of a flickering display manner, a half-tone dot meshing display manner, and a transparent color display manner.